



use of general hospitals

Variation With Methods of Payment

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A STUDY of the use of general hospitals has included an investigation of the variation in levels of use in relation to methods of payment for hospital care and in relation to existence of prepayment coverage. This variation has also been examined in relation to selected personal and economic factors. Data were collected in September 1956 through interviews of about 27,000 households, including about 90,000 persons of all ages, drawn from the civilian noninstitutional population of each State. Selected highlights of the findings on these relationships are reported here.

From each family a history was obtained of hospitalizations during the previous 12 months. This history covered each admission of each member of the household, with length of stay, reason for admission, identification of the hospital, and method of paying the hospital bill. Since the survey was conducted in connection with the monthly Current Population Survey of the Bureau of the Census, data on selected personal characteristics were available for the

members of each household. Income data were obtained by a special question in the survey. Information was also elicited about insurance or other prepayment plans covering the cost of hospital care. This part of the interview was facilitated by a previous letter to each family asking them to be ready to supply such information.

Instructions to enumerators contained two principal definitions. The "hospital bill" was defined as "all charges made by the hospital and charges by surgeons, anesthetists, special nurses, or others engaged by the patient for service in the hospital." "Hospital prepayment coverage" was defined as including the following hospital insurance and medical care plans:

1. Commercial hospital insurance (when not limited to accidents), on either individual or group basis.
2. Blue Cross or Blue Shield plans or other nonprofit plans sponsored by medical societies, on either individual or group basis.
3. Consumer-sponsored plans (not types 1 and 2) which provide prepaid hospital care, including cooperatives and plans sponsored by fraternal organizations.
4. Industrial plans of an employer or union which provide hospital care beyond that legally required for industrial accidents.

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This is the third interim report of provisional findings from a national household survey of the use of general hospitals. The first, published in the May 1957 issue of *Public Health Reports* (pp. 397-403), briefly described the survey procedure and presented findings on demographic and ecologic factors in the use of inpatient facilities. The second, published in the June 1957 issue of *Public Health Reports* (pp. 478-483), presented findings on demographic, ecologic, and economic factors in the use of outpatient facilities. Analysis and interpretation of all data and comparison with other studies will be included in a summary monograph when the tabulations are completed.

The survey is considered a first step in defining more precisely appropriate standards of need for general hospitals in the light of changing medical practice and changing patterns of care. It is expected to point the way to more intensive studies of the real need for physical facilities for adequate care of a known and described population. The survey was conducted for the Division of Hospital and Medical Facilities of the Public Health Service in September 1956 by the Bureau of the Census, in connection with its monthly Current Population Survey.

5. Other free or reduced-cost hospital plans, such as hospital employee benefits, free care for dependents of Armed Forces members, and the like.

Particular effort was made to include only insurance or plans that were general in extent and to exclude those for particular purposes or of uncertain availability. Not included as hospital prepayment coverage were (a) policies covering only accidents, "dread diseases," income lost from disability, clinic or office visits, or liability for injury to others, or (b) free hospital care for veterans in Veterans Administration hospitals.

The reports of hospitals used were screened to avoid counting time spent in long-term hospitals or nursing homes. All available inventories and registers were consulted for this purpose.

The data collected have certain limitations, since they do not cover institutional popula-

tions or persons who were hospitalized during the 12-month period but who died, moved, or entered the Armed Forces before the survey was taken. Members of the Armed Forces were not enumerated, although other persons in the same household were included. In addition, reporting and tabulating difficulties made it necessary to confine a portion of the study to persons 14 years old and over. A summary monograph, to be published after the interim reports are concluded, will contain an appraisal of underreporting in the survey, and will also discuss measures of sampling variability and the problems of errors of response. (Some comments on these matters were included in the second interim report.)

Methods of Payment

The following four methods of payment were identified in the survey:

Prepayment plan: Any part of the hospital bill paid by hospital insurance or a medical care plan (see definitions above).

Self or relatives, or both: Any part of the hospital bill paid by the patient or his relatives, including those living outside his household.

No charge made: Free care, either in a public hospital (city, State, or Veterans Administration) or in one supported by private, charitable, or community chest funds, and including hospitalization cost paid directly by public assistance or relief agencies.

Other methods: Cost met in some way not included in first three classes, such as assistance by friends, payments by employer without any regular medical plan or under workmen's compensation, insurance payments under driver's liability when hit by automobile.

These methods occurred singly and in combination. The most frequent combination reported was that of prepayment plan plus payment by self or relatives. Other combinations were infrequent. Accordingly, hospital use has been tabulated under the four single methods of payment and also under the principal combination.

Three measures of the level of hospital use were employed throughout the study: (a) annual admissions per 1,000 population, (b) annual patient-days per 1,000 population, and (c)

Table 1. General hospital use, by age and method of payment for care

Age groups, in years	Method of payment for care					
	All methods	Prepayment plan only	Prepayment plan plus self or relatives	Self or relatives, or both	No charge	Other methods
Annual admissions per 1,000 population						
All ages.....	101	29	36	23	6	5
Under 14.....	54	20	20	10	3	3
14-24.....	119	32	32	39	8	6
25-34.....	162	50	60	37	8	7
35-44.....	109	35	44	17	6	7
45-54.....	93	26	42	13	5	7
55-64.....	104	27	42	20	8	6
65 and over.....	125	18	36	48	10	13
Annual patient-days per 1,000 population						
All ages.....	810	189	271	163	116	71
Under 14.....	279	86	82	51	36	23
14-24.....	649	174	171	169	83	50
25-34.....	991	282	357	176	115	60
35-44.....	912	252	339	115	119	87
45-54.....	926	208	388	114	119	87
55-64.....	1,331	272	490	245	234	87
65 and over.....	1,744	197	445	570	312	217
Average stay per admission, in days						
All ages.....	8.1	6.5	7.5	7.0	20.1	14.2
Under 14.....	5.2	4.4	4.2	5.2	14.6	7.7
14-24.....	5.5	5.4	5.4	4.3	9.9	8.3
25-34.....	6.1	5.7	5.9	4.8	15.4	8.6
35-44.....	8.4	7.1	7.7	6.7	20.8	12.4
45-54.....	9.9	7.9	9.2	8.7	26.6	12.4
55-64.....	12.8	10.1	11.8	12.1	30.1	14.5
65 and over.....	14.0	11.2	12.5	11.9	32.4	16.7

NOTE: Discrepancies in totals result from rounding.

average stay per admission. These measures of use have been compiled under each method of payment for care according to the patient characteristics of age, family income, and reason for admission.

Age has a considerable influence on the level of hospital use, regardless of the method of payment for care (table 1). In general, as age increases, so does the annual number of patient-days under each of the several methods of payment. However, when hospitalization is paid for by a prepayment plan alone, the rate of

patient-days reaches a peak at ages 25-34 years and then declines through ages 45-54. A new peak is reached at the ages 55-64 years, with a second decrease for persons 65 and over.

The average stay also rises steadily with age. It accelerates much more rapidly when care is free than when it is covered by any other method of payment. Free-care patients aged 55 to 64 years and those 65 and over were hospitalized for averages of 30 and 32 days per admission, or more than twice the average stay of all persons at these ages.

Table 2. General hospital use, by members of primary families,¹ by family income and method of payment for care

Family income	Method of payment for care					
	All methods	Prepayment plan only	Prepayment plan plus self or relatives	Self or relatives, or both	No charge	Other methods
Annual admissions per 1,000 population						
All incomes.....	102	30	37	23	5	5
Under \$1,000.....	84	7	13	36	13	14
\$1,000-\$1,999.....	97	15	20	36	12	13
\$2,000-\$2,999.....	110	27	30	34	10	7
\$3,000-\$3,999.....	107	35	35	25	5	6
\$4,000-\$4,999.....	103	37	45	21	2	3
\$5,000-\$7,499.....	104	36	45	16	2	3
\$7,500-\$9,999.....	91	30	44	12	3	3
\$10,000 and over.....	84	26	40	15	(²)	3
Income not reported.....	102	27	37	25	4	8
Annual patient-days per 1,000 population						
All incomes.....	768	191	273	153	85	65
Under \$1,000.....	810	41	105	346	170	145
\$1,000-\$1,999.....	964	136	153	261	212	187
\$2,000-\$2,999.....	942	201	282	208	178	72
\$3,000-\$3,999.....	810	219	253	143	119	74
\$4,000-\$4,999.....	676	226	289	105	27	29
\$5,000-\$7,499.....	700	200	321	106	31	43
\$7,500-\$9,999.....	623	192	305	76	28	22
\$10,000 and over.....	699	163	376	144	1	15
Income not reported.....	837	223	261	172	123	58
Average stay per admission, in days						
All incomes.....	7.6	6.4	7.3	6.6	16.7	13.0
Under \$1,000.....	9.6	5.7	7.9	9.5	12.9	10.3
\$1,000-\$1,999.....	9.9	9.3	7.7	7.2	17.6	14.4
\$2,000-\$2,999.....	8.6	7.5	9.3	6.2	17.8	10.3
\$3,000-\$3,999.....	7.6	6.3	7.2	5.7	23.0	12.3
\$4,000-\$4,999.....	6.2	6.2	6.4	4.9	11.5	9.7
\$5,000-\$7,499.....	6.8	5.5	7.1	6.6	12.9	14.3
\$7,500-\$9,999.....	6.8	6.4	7.0	6.5	10.0	7.1
\$10,000 and over.....	8.3	6.3	9.4	6.7	1.5	5.0
Income not reported.....	8.2	8.4	7.0	6.9	28.2	7.3

¹ Primary families include persons related by blood, marriage, or adoption (one of these being the head of the household). ² Less than 0.5.

NOTE: Discrepancies in totals result from rounding.

Family income appears also to affect the level of hospital use under each method of payment (table 2). Admissions paid for by prepayment plans rise rapidly with family income to the \$5,000 level, remain stable until the \$7,500 level, and then decline slowly. Families with in-

comes below \$1,000 pay for nearly one-half of all their admissions and patient-days through their own resources alone. Families with incomes between \$1,000 and \$3,000 have the highest rate of hospital use as measured in patient-days per year.

Table 3. General hospital use, by reason for admission and method of payment for care

Reason for admission	Method of payment for care					
	All methods	Prepayment plan only	Prepayment plan plus self or relatives	Self or relatives, or both	No charge	Other methods
Annual admissions per 1,000 population						
All reasons	100	29	36	23	6	5
Surgery	25	6	11	5	2	1
Obstetrics	22	5	7	7	1	(¹)
Pediatrics	16	6	6	3	1	1
Accidents	6	2	1	1	(¹)	1
Other reasons	32	10	11	7	2	1
Annual patient-days per 1,000 population						
All reasons	808	188	271	163	116	71
Surgery	261	45	104	51	41	21
Obstetrics	96	25	34	29	4	4
Pediatrics	82	25	24	15	11	7
Accidents	77	20	14	14	17	12
Other reasons	292	73	94	54	44	27
Average stay per admission, in days						
All reasons	8.1	6.5	7.5	7.0	20.2	12.2
Surgery	10.6	7.6	9.6	10.4	26.7	14.6
Obstetrics	4.5	4.6	4.8	4.0	4.4	6.1
Pediatrics	5.2	4.4	4.2	5.2	14.6	13.1
Accidents	12.1	8.7	10.2	12.0	41.4	11.2
Other reasons	9.3	7.7	8.6	7.7	20.8	14.6

¹ Less than 0.5. NOTE: Discrepancies in totals result from rounding.

Reasons for admission, with the exception of obstetrics, seem not to have much effect on hospital use in relation to the different methods of paying for care (table 3). For obstetrical care, 30 percent of all patient-days were paid for solely by the family, as compared with 20 percent for all reasons for admission. For each reason for admission except obstetrics, average stay was less under prepayment plans, either when they were the sole method of payment or when they were supplemented by family resources, than the average stay for all persons. Average stay under free care was much longer than care covered by other methods of payment for all reasons for admission except obstetrics and "other reasons."

Prepayment Protection

As a supplement to the tabulations on methods of payment, tabulations have been developed to show contrasts in use between patients having some prepayment protection and those having none. These tabulations exclude children under the age of 14 years, for whom data were incomplete. They relate only to the population receiving hospital care, not to the population as a whole. In obtaining data on types of prepayment protection, the enumerators identified and reported only the most comprehensive plan for persons who had two or more plans.

The type of prepayment plan and the type of coverage are both related to the level of hospital use (table 4). Persons with at least some pre-

Table 4. General hospital use among persons 14 years old and older, by prepayment protection status and type of coverage

Prepayment protection status and type of coverage	Annual admissions per 1,000 population	Annual patient-days per 1,000 population	Average stay per admission, in days
All persons aged 14 and over-----	120	1, 032	8. 6
With prepayment protection:			
All types of protection-----	135	1, 043	7. 7
Hospital coverage only-----	109	982	9. 0
Hospital and surgery-----	138	1, 037	7. 5
Other combinations-----	151	1, 189	7. 9
Blue Cross plans ¹ -----	135	1, 131	8. 4
Hospital coverage only-----	112	1, 087	9. 7
Hospital and surgery-----	138	1, 114	8. 1
Other combinations-----	159	1, 524	9. 6
Other plans-----	136	953	7. 0
Hospital coverage only-----	103	770	7. 5
Hospital and surgery-----	138	960	6. 9
Other combinations-----	147	1, 046	7. 1
Without prepayment protection-----	93	1, 013	10. 8

¹ Includes Blue Shield plans.

payment protection (regardless of its comprehensiveness) make more frequent use of hospitals than those without any protection. For the population 14 years of age and over, the annual admission rate for those with prepayment protection is 135 per 1,000 population; for those without protection it is 93 per 1,000 population. Average stay per admission, however, is lower for those with protection (7.7 days) than for those without it (10.8 days). Consequently, the number of patient-days per 1,000 population is about the same for both groups.

Persons with Blue Cross protection are admitted to hospitals at the same rate as those protected under other plans. (In this study the term "Blue Cross" includes Blue Shield plans as well, and is used in referring to either type of plan or both types.) They stay considerably longer, however, and thus use more patient-days: 1,131 per 1,000 population as compared with 953.

Substantial differentials appear in the level of use as measured by annual patient-days under

Table 5. General hospital use, by prepayment protection status and age

Age groups, in years	Prepayment protection status		
	All persons	With prepayment protection	Without prepayment protection
	Annual admissions per 1,000 population		
All ages-----	101 (¹)	(¹) 135	(¹) 93
14 and over-----			
Under 14-----	54	(¹)	(¹)
14-24-----	119	131	100
25-34-----	162	177	123
35-44-----	109	122	77
45-54-----	93	107	63
55-64-----	104	120	76
65 and over-----	125	154	108
	Annual patient-days per 1,000 population		
All ages-----	810 1, 032	(¹) 1, 043	(¹) 1, 013
14 and over-----			
Under 14-----	279	(¹)	(¹)
14-24-----	649	666	623
25-34-----	991	1, 059	825
35-44-----	912	966	775
45-54-----	926	954	865
55-65-----	1, 331	1, 389	1, 233
65 and over-----	1, 744	1, 855	1, 680
	Average stay per admission, in days		
All ages-----	8. 1 8. 6	(¹) 7. 7	(¹) 10. 8
14 and over-----			
Under 14-----	5. 2	(¹)	(¹)
14-24-----	5. 5	5. 1	6. 2
25-34-----	6. 1	6. 0	6. 7
35-44-----	8. 4	7. 9	10. 1
45-54-----	9. 9	8. 9	13. 7
55-64-----	12. 8	11. 6	16. 2
65 and over-----	14. 0	12. 0	15. 6

¹ Data not available.

different types of coverage. The level of use was lower when prepayment protection covered hospitalization alone or hospitalization and surgery than when coverage consisted of "other combinations." Coverage for hospital and surgical costs results in a shorter average stay than does hospital coverage alone.

Table 6. General hospital use by members of primary families ¹ 14 years old and over, by family income, prepayment protection status, and type of prepayment coverage: Rates based on total population in income class

Family income	All members	Members with prepayment protection			Members without prepayment protection
		All members covered	Covered by Blue Cross ²	Covered by other plans	
Annual admissions per 1,000 population					
All incomes.....	122	90	45	45	33
Under \$1,000.....	105	25	9	16	80
\$1,000-\$1,999.....	120	58	27	31	62
\$2,000-\$2,999.....	138	85	38	46	53
\$3,000-\$3,999.....	133	98	47	51	34
\$4,000-\$4,999.....	137	113	55	58	24
\$5,000-\$7,499.....	120	104	53	51	16
\$7,500-\$9,999.....	102	88	47	42	13
\$10,000 and over.....	91	77	49	28	14
Income not reported.....	116	85	47	38	31
Annual patient-days per 1,000 population					
All incomes.....	986	679	370	309	307
Under \$1,000.....	1,047	195	104	91	852
\$1,000-\$1,999.....	1,196	472	274	198	724
\$2,000-\$2,999.....	1,249	738	398	340	511
\$3,000-\$3,999.....	1,056	748	381	367	308
\$4,000-\$4,999.....	915	751	393	358	164
\$5,000-\$7,499.....	896	767	399	368	129
\$7,500-\$9,999.....	755	653	393	259	103
\$10,000 and over.....	852	703	478	225	148
Income not reported.....	971	682	406	277	288
Average stay per admission, in days					
All incomes.....	8.1	7.6	8.3	6.9	9.4
Under \$1,000.....	9.9	7.7	11.4	5.7	10.6
\$1,000-\$1,999.....	10.0	8.2	10.3	6.4	11.7
\$2,000-\$2,999.....	9.1	8.7	10.4	7.3	9.7
\$3,000-\$3,999.....	8.0	7.6	8.0	7.2	9.0
\$4,000-\$4,999.....	6.7	6.7	7.2	6.2	6.9
\$5,000-\$7,499.....	7.5	7.4	7.6	7.2	7.9
\$7,500-\$9,999.....	7.4	7.4	8.4	6.2	7.9
\$10,000 and over.....	9.3	9.1	9.8	8.0	10.5
Income not reported.....	8.3	8.0	8.6	7.2	9.3

¹ Primary families include persons related by blood, marriage, or adoption (one of these being the head of the household).

² Includes Blue Shield plans.

NOTE: Discrepancies in totals result from rounding.

In each age group, persons with prepayment protection have a higher admission rate than do those without protection (table 5). However, their average stay is shorter, particularly in the older groups, and consequently there is less difference in the number of patient-days.

To examine hospital use rates in relation to family income and prepayment protection status, rates have been computed on two separate bases: (a) total population in each income group and (b) population in each protection status in each income group.

Table 7. General hospital use by members of primary families¹ 14 years old and over, by family income, prepayment protection status, and type of prepayment coverage: Rates based on population in each protection status in each income class

Family income	All members	Members with prepayment protection			Members without prepayment protection
		All members covered	Covered by Blue Cross ²	Covered by other plans	
Annual admissions per 1,000 population					
All incomes	122	137	136	139	94
Under \$1,000.....	105	127	129	126	100
\$1,000-\$1,999.....	120	166	194	148	95
\$2,000-\$2,999.....	138	170	187	159	105
\$3,000-\$3,999.....	133	150	156	145	100
\$4,000-\$4,999.....	137	152	146	158	92
\$5,000-\$7,499.....	120	129	126	132	84
\$7,500-\$9,999.....	102	107	101	115	75
\$10,000 and over.....	91	97	100	92	69
Income not reported.....	116	138	135	139	82
Annual patient-days per 1,000 population					
All incomes	986	1,040	1,125	954	885
Under \$1,000.....	1,047	982	1,466	714	1,063
\$1,000-\$1,999.....	1,196	1,364	2,001	947	1,107
\$2,000-\$2,999.....	1,249	1,486	1,946	1,165	1,016
\$3,000-\$3,999.....	1,056	1,143	1,256	1,044	892
\$4,000-\$4,999.....	915	1,015	1,049	981	630
\$5,000-\$7,499.....	896	952	952	952	663
\$7,500-\$9,999.....	755	789	845	717	595
\$10,000 and over.....	852	886	980	735	720
Income not reported.....	971	1,091	1,161	1,002	770

¹ Primary families include persons related by blood, marriage, or adoption (one of these being the head of the household).

² Includes Blue Shield plans.

The first series of rates permits study of the magnitude of the components of total use within each income group, according to prepayment status (table 6). On this basis it appears that hospital use, in patient-days, by families with low incomes (below \$2,000) is largely without protection. Families with incomes above \$4,000, on the other hand, have prepayment protection for most of their hospital use.

Table 7 permits study of the specific levels of use by families in each protection status at each income level. It shows that both admissions and patient-days are greatest for low-income families, regardless of protection status, and that they decline steadily in the middle-income and upper-income ranges. Families with incomes below \$4,000 with Blue Cross pro-

tection use hospitals at a notably higher rate than do other families in these income groups, with a maximum of 2,000 annual patient-days per 1,000 population, as compared with about 1,100 patient-days for those with other types of plans or not covered.

Summary

Data on use of general hospitals, obtained in a national household survey of about 27,000 families, with 90,000 persons of all ages, reveal the following variations with different methods of payment for care:

1. Hospital use rises rapidly with age when costs are met by a prepayment plan plus personal payments, personal payments alone, or free care, but hospitalization paid for by a pre-

payment plan alone shows no net increase in the rate of patient-days after age 34 years.

2. Patients aged 55 years and over for whom no charge is made have an average stay of 1 month, twice the average stay for all admissions.

3. Families with incomes under \$3,000 pay for about one-half of their hospital care through their own resources or else have free care.

4. When care is paid for by a prepayment plan plus family resources, annual patient-days rise as family income increases.

A comparison of hospital use with prepayment protection and use without it, for the population 14 years of age and over, shows the following highlights:

1. Prepayment protection is associated with more admissions and more patient-days per 1,000 population.

2. At all ages, persons with prepayment protection have a higher admission rate but a shorter stay than those without protection.

3. Low-income families (under \$1,000) without prepayment protection have substantially more admissions and more patient-days than do similar families with protection, while the reverse is true at higher income levels.

4. Families with incomes below \$4,000 who have Blue Cross protection use hospitals at a notably higher rate than all other families in this income range.

Selwyn D. Collins, 1891–1959

Dr. Selwyn D. Collins, on the staff of the Public Health Service since 1920, died March 24 in Boston. An innovator in public health research techniques, he was chief of the Division of Public Health Methods' Morbidity and Health Statistics Branch for nearly two decades. His work included participation in the Hagerstown Morbidity Studies, the Committee on the Costs of Medical Care, the first National Health Survey, and the survey of the Eastern Health District of Baltimore in which the Public Health Service, the Milbank Memorial Fund, Johns Hopkins University School of Hygiene and Public Health, and the Baltimore City Health Department collaborated.

In 1930 Dr. Collins began his studies of excess mortality associated with epidemics of influenza. He showed that mortality from other causes also increased during epidemics.

Beginning in 1938 Dr. Collins served on three decennial conferences for the revision of the International List of Causes of Death and assisted in developing the combined morbidity and mortality code for classification of diseases

now in use by member nations of the World Health Organization. He was chairman of the Index Subcommittee for the 1948 edition of the International Statistical Classification of Diseases, Injuries, and Causes of Death. Also, in the international field, he worked with the International Health Organization of the League of Nations and was a member of the WHO Expert Committee on Health Statistics. He was consultant on vital statistics to the occupation government in Japan, and, recently, a delegate to the Second International Statistical Congress, Bogotá, Colombia.

In conjunction with the editors of the 1952 edition of the Standard Nomenclature of Diseases and Operations, he directed the conversion of diagnoses to ISC categories.

A Fellow of the American Public Health Association, Dr. Collins served for 2 years as chairman of the statistics section. He was a member of the American Epidemiological Society and of the Washington Academy of Sciences.